related to excessive mucus production, symptoms related excessive gas production gas and symptoms related excessive blood production. A modern scoring system should have two or more atomized symptoms related to each of the six illnesses and appropriate response scales for frequency, intensity and duration.

SP-0019
Measuring anorectal toxicity and function
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Anorectal toxicity is a relevant side effect of pelvic radiotherapy for rectal, anal, gynaecologic and prostate cancer. Toxicity can be scored objectively by the physician according to established systems such as the CTCAE classification. In recent years, patient-reported outcomes (PROs) have received increasing attention when evaluating acute toxicity as well as late effects of cancer treatment. These include information directly obtained from the patient on symptoms and impairment as well as on quality of life. This presentation will focus on validated instruments to measure PROs related to anorectal function, including quality-of-life questionnaires and organ modules, e. g. those developed by the EORTC Quality of Life Group, and symptom questionnaires e. g. to measure continence. Objective measurements to quantify anorectal function such as sphincter manometry and endoscopic scores will be reviewed. The relationship between PROs and objective function assessment with physician-rated toxicity will be addressed. The outcomes for the above endpoints in major trials of pelvic radiotherapy will be presented, with a focus on rectal cancer and the effects of treatment concepts including short-course radiotherapy and long-course chemoradiation. Finally, dose-volume constraints in pelvic radiotherapy treatment planning and potential effects of highly conformal techniques such as IMRT or VMAT on anorectal symptoms, function and quality of life will be examined.

SP-0020
Rectal spacers to minimise morbidity in radiotherapy for prostate cancer
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Radiotherapy is a well recognozed curative treatment option for localized prostate cancer. Optimal tumor control rates can only be achieved with high local doses, associated with a considerable risk of rectal toxicity - regarded as dose-limiting toxicity. Apart from already widely adapted technical advances, as intensity-modulated radiation therapy and image-guided radiotherapy techniques, the application of spacers placed between the prostate and anterior rectal wall has been increasingly used in the last years.
Biodegradable spacers, including hydrogel, hyaluronic acid, collagen or an implantable balloon can create the desired effect. They can be injected or inserted in a short procedure under transrectal ultrasound guidance via a transperineal approach. A distance of about 1.0-1.5cm is usually achieved between the prostate and rectum, excluding the rectal wall from the high isodoses. Several studies have shown well tolerated injection procedures and treatments. Apart from considerable reduction of rectal dose compared to radiotherapy without a spacer, clinical toxiciyt results are favourable. A prospective randomized trial demonstrated a reduction of rectal toxicity after hydrogel injection in men undergoing prostate image-guided intensity-modulated radiation therapy. The results are encouraging for continuing evaluation in dose escalation, hypofractionation, stereotactic radiotherapy or re-irradiation trials in the future.

Symposium: Towards user oriented QA procedures for treatment verification

SP-0021
How to ensure the quality in brachytherapy treatment planning systems?
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Treatment planning systems (TPSs) are of high importance in modern brachytherapy. The users rely on the output of these special software; wrong calculations may result in severe patient harm. Thus it is necessary to systematically check these software programs.
Many checks in TPSs are identical for high-dose-rate brachytherapy with afterloaders and low-dose-rate brachytherapy with seeds. But some differences exist, e.g. as checking of afterloader parameters.
After the installation of the software the acceptance test is to be carried out. This test protocol is typically provided by the vendor and should be passed before further checking. In a second step the commissioning is carried out. In this procedure all clinical relevant data and properties of the TPS must be tested and reported. Examples for items to check are:
- Afterloader characteristics (number of channels, min./max. channel lengths, max. allowed dwell time, …)
- Source characteristics (nuclide, decay, …)
- TG-43 consensus dataFor Model-based dose calculation algorithms, commissioning following TG-186 report
- Applicator checks
To ensure the consistency and data integrity of the TPS periodical tests should be performed after the commissioning. Important points are to validate the integrity of base parameters of the TG-43 data and the recalculation of patient treatment plans.
Most TPSs offer inverse planning algorithms. The algorithm itself is often not fully transparent by the user, thus comparison with manual calculations is not practical. Nevertheless, the consistency of such planning technique can be checked by recalculation of a test plan using a constant parameter set. In addition to the tests above end-to-end tests can be performed to check the whole treatment chain, including imaging, TPS, afterloader, and data transfer.

SP-0022
Imaging
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In the past decade 3D image guided brachytherapy has been introduced into clinical practice worldwide. This enables conformation of the dose distribution to the target volume and avoidance of high dose to organs at risk (OAR) using CT, MR, and/or ultrasound (US) imaging. In such modern techniques sectional images give the relationship of the shape and the position of the applicator(s)/sources in relation to the anatomy of the patients. This means that the quality assurance (QA) programs also should include specific topics related to image quality additional to traditional procedures checking the source strengths and dose calculation issues. QA for image quality is well established in the area diagnostic and many of these procedures can be used also for brachytherapy. However, the procedures should be modified in order to reflect the conditions of use in brachytherapy compared to a diagnostic session.
To optimise the image quality in diagnostic procedures dedicated phantom is often used. Various image quality parameters are tested by evaluation for example slice thickness, spatial resolution, uniformity and noise. In contrast to diagnostic imaging, the ability to reconstruct several points or a geometric structure with high accuracy is crucial in brachytherapy. Therefore, a procedure to check the geometric accuracy have to be included in a QA program.